REMARKS

This paper is being provided in response to the Office Action mailed August 26, 2003 for the above-referenced application. In this response, Applicant has cancelled claim 13 without prejudice or disclaimer of the subject matter thereof. Applicant submits the following remarks and encloses herewith a Declaration of Mark Alistair Poletti under 37 C.F.R. 1.132.

Applicant's present claimed invention is directed to a preamplifier system for a guitar or other musical instrument. An electric guitar preamplifier conventionally applies non-linear distortion, which is part of what creates the guitar sound. As noted above in the listing of claims, claims 21, 33, 40 and 41 are independent and claims 22-32 and 34-39 depend thereon.

Before addressing the specific rejections, Applicant directs attention to the state of the art of preamplifiers as described in the background of the present specification in order to highlight the differences of the claimed invention from the prior art. For example, as referred to in the present specification on page 9, Anderton previously disclosed a guitar preamplifier in which the signal from the guitar is split into a number of separate frequency bands, each band is distorted, and then the bands are recombined. Splitting the input signal into frequency bands enables the desired harmonic distortion to be introduced in a controlled manner while reducing intermodulation products, which can introduce undesirable distortion that does not produce the pleasing musical effect. The net result is distortion which is not harsh but more subjectively pleasing. Copies of the Anderton papers referred to on page 9 of the specification have previously been submitted with the Information Disclosure Statement filed 30 August 2002.

Applicant also band filters the guitar signal, but in addition uses filtering means with a substantially equi-phase response for each frequency band. The equi-phase response assists recombination of the frequency bands, after distortion has been applied. The equi-phase response enables the desired distorted sound to be retained when recombining the bands. With equi-phase filtering the sound quality of a multi-band guitar preamplifier distortion system is further improved. Because of the equi-phase channel responses, and the similar nonlinear distortion circuits, both the fundamental frequency and all of the nonlinearly generated harmonics will have identical phases, and will therefore combine without cancellation occurring. The sum response has a flat frequency response, hence imparting no spectral colouration to the sound, and the distortion products generated in each band add in-phase, preventing cancellation of the distortion products. The result sounds more even, coherent, and natural to that of the system with non-equi-phase filters. The output with zero-phase error is shown in Figure 3 of the application, and demonstrates no crossover-like artefacts. Chords can be played with reduced intermodulation, which otherwise produces a harsh, buzzing sound, and sound coherent and clear. See the accompanying Declaration of Mark Alistair Poletti, particularly paragraphs 6 to 9.

The rejection of claim 13 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,412,100 to Orban (hereinafter "Orban") in view of JP 404142598 to Koichiro (hereinafter "Koichiro") has been rendered moot by the cancellation of claim 13 herein.

The rejection of claims 21, 24-25, 28, 30-33, 35-36, 38, 40 under 35 U.S.C. 103 (a) as being unpatentable over U.S. Patent No. 5,892,833 to Maag (hereinafter "Maag") in view of U.S.

Patent No. 5,848,164 to Levine (hereinafter "Levine") is hereby traversed and reconsideration is respectfully requested.

The Maag reference discloses a form of equalizer which produces an overall phase response which is asserted to be relatively constant across the audio frequency range. A stated goal of this system is to reduce distortion (see col. 2, lines 42-46 and line 58 of Maag).

The Levine reference discloses a system and method for effects processing on audio subband data. The system splits a fullband audio signal into a number of subbands and then applies one or more subband effect filters to one or more of the subbands in order to produce desired audio effects such as flanging, chorusing, and reverberation. (See Abstract of Levine.)

Applicant's present claimed invention recites *a substantially equi-phase response for each frequency band.* Applicant has found that this provides superior performance, as referred to above and in the Poletti Declaration. The Examiner cites Maag and states that it teaches "...a filtering means (see Fig 6a, 208) for splitting an input signal into two or more separate frequency bands (212a 212n) **comprising a substantially equi-phase response for each frequency band....**". Applicant respectfully submits that this analysis is not technically correct and directs attention to the accompanying Poletti Declaration, paragraphs 10 to 12. As discussed therein, the filters of Maag do not have an equi-phase response. Thus even if the device of Maag were combined with the band splitting of Levine, the Maag reference does not disclose the equi-phase response filtering of Applicant's claims.

Furthermore, Levine relates to an audio effects processing system which produces linear audio effects, rather than non-linear distortion. The system splits a fullband audio signal into a number of subbands and then applies one or more subband effect filters to one or more of the subbands in order to produce desired audio effects such as flanging, chorusing, and reverberation. The subband effect filters, such as the flange, chorus and reverberation effect filters (shown in Figures 4, 5 and 6 of Levine respectively and referred to in Figure 7 as 701-703) are **linear** circuits rather than non-linear distortion circuits - see paragraph 13 of the accompanying Poletti Declaration.

In contrast, Applicant's present claimed invention concerns **non-linear circuits which distort the frequency bands** and Applicant's independent claims specifically recite *two or more non-linear circuits, each of which distorts the input signal component of one of the frequency bands*. The effect filters used in Levine are linear and do not introduce harmonic distortion into the subband signals. Therefore the Levine reference also does not disclose what is required by Applicant's claims.

Applicant respectfully submits that neither Maag nor Levine, taken alone or in combination, teach or fairly suggest at least the features of a guitar preamplifier including *a filtering means for splitting an input signal into two or more separate frequency bands comprising a substantially equi-phase response for each frequency band* and *two or more non-linear circuits, each of which distorts one of the frequency bands*, as claimed by Applicant. Accordingly, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

Moreover, in addition to the above remarks concerning the omission of Applicant's claimed elements from the prior art of record, Applicant respectfully submits that one skilled in the art would not be motivated to combine Levine with Maag. One of the Maag objectives is to "reduce distortion and thereby improve clarity". Maag relates to a gain and equalisation system for reducing distortion, phase shift and other anomalies, and improving clarity in a variety of available sound systems, such as "radio and television broadcast systems, radio and television receivers, tape recorders and disk recorders and players, home, auto and portable stereo systems, and recording systems" (column 1, lines 25-28 of Maag). As recited in column 2, lines 43-46, "it is an object of the [Maag] invention to provide such a system and method for effectively **reducing distortion**, thereby improving clarity in currently available sound systems".

Applicant deliberately introduces harmonic distortion, to generate new frequencies and produce the classic electric guitar sound. It is unlikely one would consider applying the Maag filter system to electric guitar preamplifiers which aim deliberately to **introduce nonlinear distortion**.

As to Levine, again Applicant's claimed invention relates to introducing distortion, into each of a number of the analogue bands via non-linear circuits, whereas Levine creates linear audio effects such as flanging, chorusing, and reverberation. The objective of Levine is again different. One skilled in the art of guitar preamplifier systems would be unlikely to consider art concerning applying **linear** digital audio effects, to the art of guitar preamplifiers for creating **non-linear harmonic distortion**.

Accordingly, for all of the reasons stated above, Applicant respectfully requests that the rejection of the claims over Maag in view of Levine be reconsidered and withdrawn.

The rejection of claim 41 under 35 U.S.C. 103(a) and the rejection of claims 22-23, 29, 34 and 39 all as being unpatentable over Maag in view of Levine and further in view of Orban is hereby traversed and reconsideration is respectfully requested.

Applicant's claims are discussed above in view of the Maag and Levine references.

The Orban reference discloses a multiband analog audio process which provides low peak-to-r.m.s ratios of audio signals. A distributed crossover system is used with bandpass filters containing internal clippers.

Applicant respectfully submits that Orban fails to overcome the above-noted deficiencies of Maag and Levine with respect to Applicant's claimed invention. Specifically, neither Orban, Maag nor Levine, taken alone or in any combination, teach or fairly suggest at least the features of a guitar preamplifier including *a filtering means for splitting an input signal into two or more separate frequency bands comprising a substantially equi-phase response for each frequency band* and *two or more non-linear circuits, each of which distorts one of the frequency bands*, as claimed by Applicant. Accordingly, Applicant respectfully requests that these rejections be reconsidered and withdrawn.

The rejection of claims 26-27 and 37 under 35 U.S.C. 103(a) as being unpatentable over Maag in view of Levine and further in view of Koichiro is hereby traversed and reconsideration is respectfully requested.

Applicant's claims are discussed above in view of the Maag and Levine references.

The Koichiro reference discloses an electronic musical instrument having a musical signal generating circuit to generate digital musical sound signals. The Office Action cites Koichiro as disclosing filtering means further comprising variable cross-mixing after one or more of said stages of filtering.

Applicant respectfully submits that Koichiro fails to overcome the above-noted deficiencies of Maag and Levine with respect to Applicant's claimed invention. Specifically, neither Koichiro, Maag nor Levine, taken alone or in any combination, teach or fairly suggest at least the features of a guitar preamplifier including *a filtering means for splitting an input signal into two or more separate frequency bands comprising a substantially equi-phase response for each frequency band* and *two or more non-linear circuits, each of which distorts one of the frequency bands*, as claimed by Applicant. Accordingly, Applicant respectfully requests that these rejections be reconsidered and withdrawn.

Based on the above, Applicant respectfully requests that the Examiner reconsider and withdraw all outstanding rejections and objections. Favorable consideration and allowance are earnestly solicited. Should there be any questions after reviewing this paper, the Examiner is invited to contact the undersigned at 617-248-4792

Respectfully submitted,
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